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# United States Space Foundation

## Prototype Space Technology Hall of Fame Exhibit at Technology 2003

### Analysis of Data

from

### Computer-based questionnaire

January 1994

(NASA-CR-194834) PROTOTYPE SPACE  
TECHNOLOGY HALL OF FAME EXHIBIT AT  
TECHNOLOGY 2003: ANALYSIS OF DATA  
FROM COMPUTER-BASED QUESTIONNAIRE  
(Space Foundation) 16 p

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# Technology 2003 US Space Foundation Exhibit

## Analysis of Data

### Introduction

The US Space Foundation displayed its prototype **Space Technology Hall of Fame** exhibit design at the **Technology 2003** conference in Anaheim, CA, December 7-9, 1993. In order to sample public opinion on space technology in general and the exhibit in particular, we set up a computer-based survey as a part of the display.

This report analyzes the data collected.

Survey design, survey software development, data analysis and this report are by Dr. Robert N. Ewell, *Creative Solutions*.

### Methodology

Based on experience from the Commercial Space Expo in April 1993, the survey was designed to be very short, and the computer to collect the data was within the exhibit area. (In April, five computers were scattered throughout the exhibit hall, the survey was long, and in two days only about 30 people responded.)

The computer was programmed to ask the following six space-related questions and two demographic questions (For a full text of the computer screens, please see the Appendix.):

- On a 5-point scale, how AWARE are you about technology spinoffs from space and aviation?  
5: very much aware...1: not at all aware
- On a 5-point scale, how RELEVANT to your life are technology spinoffs from space and aviation?  
5: very relevant...1: not at all relevant
- In your opinion, has the space program ACCELERATED the development of TECHNOLOGY?  
5: yes... 3: somewhat...1: no
- Would greater exposure of space technology spinoff success stories stimulate more activity in this area?  
5: yes... 3: somewhat...1: no

- On a 5-point scale, what was the IMPACT of this exhibit on your perceptions of space benefits and space technology?

- 5: A real eye opener
- 4: Significant positive impact
- 3: Some positive impact
- 2: Little positive impact
- 1: No change

- On a 5-point scale, how SUPPORTIVE ARE YOU of continued involvement of the United States in space exploration and technology?

- 5: Very supportive... 1: not supportive

- When were you born?

- What kind of INVOLVEMENT WITH SPACE or space technology do you have or have you had?

- 1: None
- 2: Government including NASA, military, or government contractor
- 3: Commercial
- 4: Space advocacy organization
- 5: Personal interest
- 6: Two or more of responses 2-5
- 7: Other

During the conference, 54 people responded to the survey. US Space Foundation personnel conjectured two reasons for the relatively low response rate (although much better than at the Expo in April):

- The booth attracted a lot of attention but did not compel people to actually enter. Many observed from outside the booth's confines.

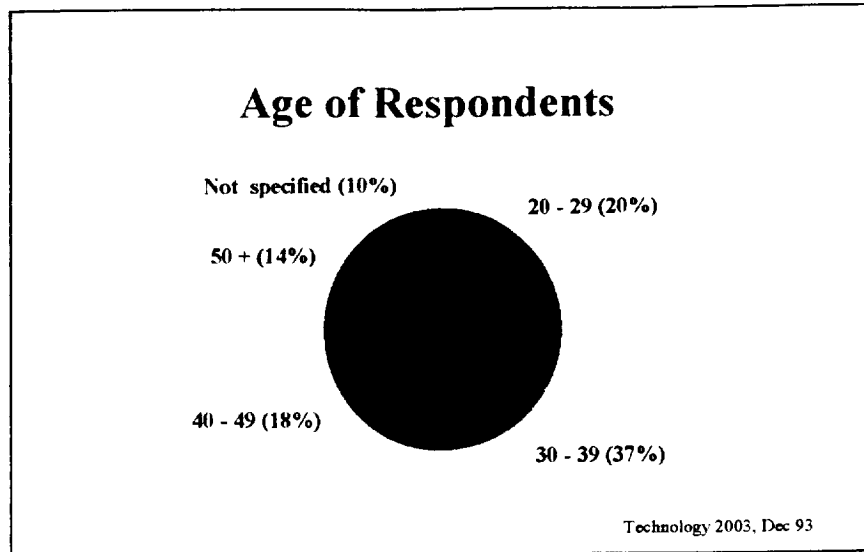
- Once in the booth, nothing on the computer display compelled people to investigate and answer the survey. Therefore, the exhibit attendant began inviting people to answer the questions.

Data were collected on a disk from which they were refined on a spreadsheet program and processed with SPSS/PC+. Part of the processing included investigation of interactions among responses with SPSS's CHAID program. The following results summary reports all statistically significant interactions among responses. For example, there was a strong relationship between one's involvement with space and one's support of space activities. If an interaction is not reported, it was not significant.

## Findings and Analysis

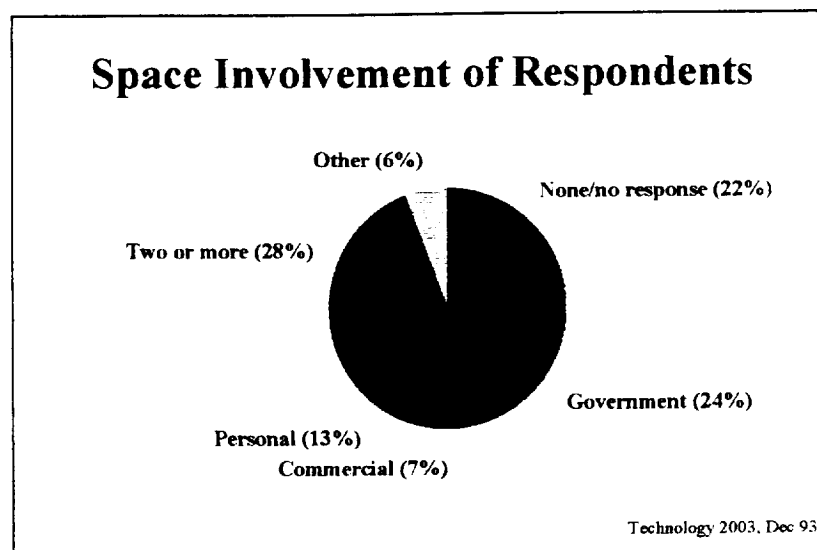
### Age of Respondents

The following chart shows the age distribution for the 54 respondents to the survey. Fairly evenly spread with, as one would expect, a slightly higher preponderance of young people. **Age was not a significant factor in any of the responses.**



### Space Involvement of Respondents

The following chart shows the mix of space involvement. Twenty-two percent report no involvement (or no response) leaving the other 78% with some space involvement (over 60% some kind of professional: government (24%), commercial (7%), two or more of the categories (which must include at least one of government or commercial) (28%).

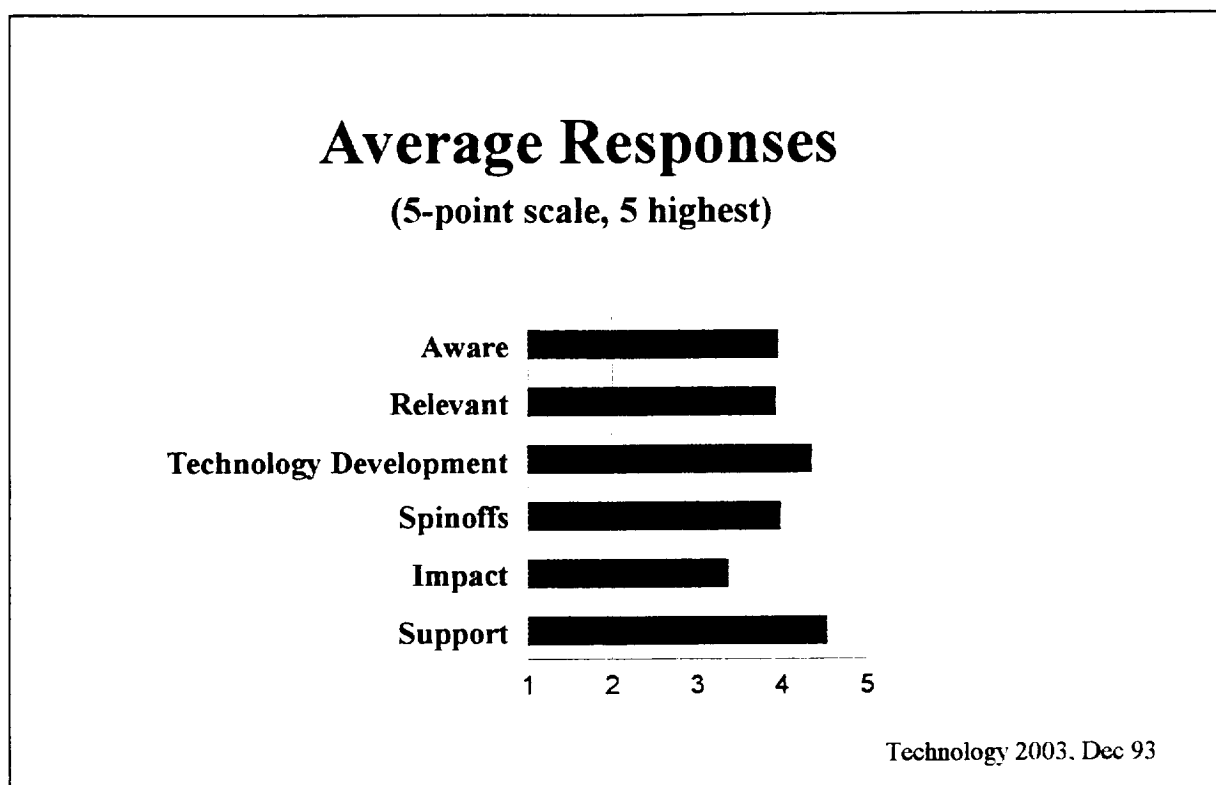


## Overall Ratings

The following chart shows the overall average of responses to the survey. Recall that the six questions were:

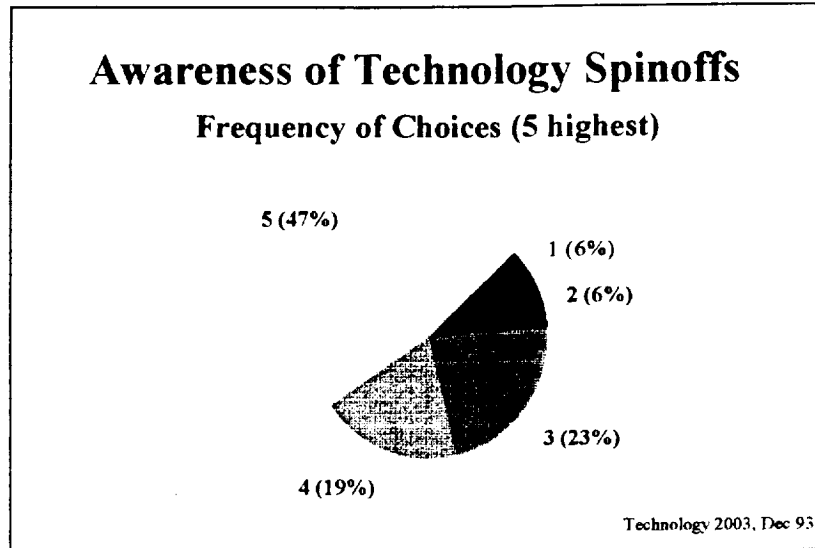
- Awareness of Technology Spinoffs (**Aware**)
- Relevance of Technology Spinoffs (**Relevance**)
- Space program acceleration of technology development (**Technology Development**)
- Stimulation of technology spinoff by spinoff success stories (**Spinoffs**)
- Impact of the exhibit (**Exhibit**)
- Supportive of the space program (**Support**)

The chart of averages shows averages around 4.0 on a 5-point scale for all but exhibit impact. It's average was lower due to a smaller number of "5" responses as we'll see later. They liked the exhibit but tended to rate it "Significant positive impact" instead of "A real eye opener!!" All of the areas experienced interaction with one other set of responses. Each question will be analyzed further beginning on the next page.

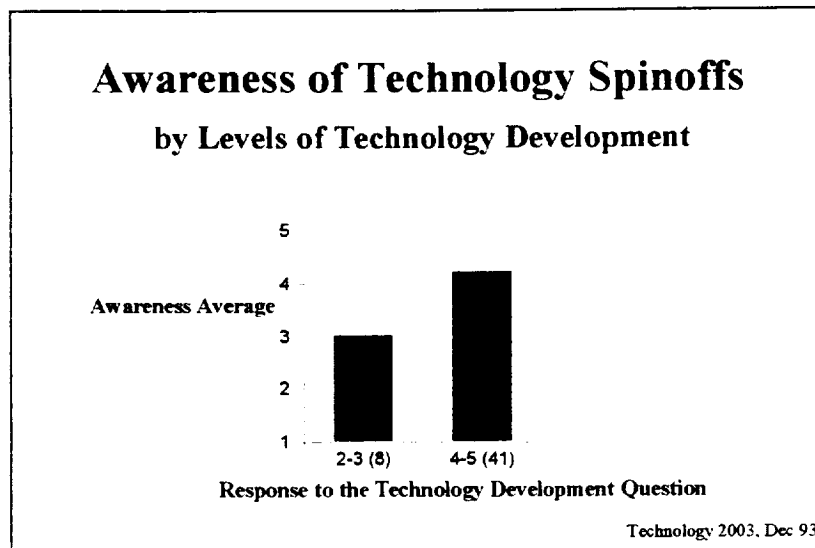


## Awareness of Technology Spinoffs

The first chart shows the distribution of ratings for this question. **In each of the six areas including this one, the pie chart of response frequencies will be colored dark to light with the lighter areas being the higher ratings.** This question drew about 2/3 4s and 5s and nearly 90% 3-5. People are aware of space technology spinoffs.

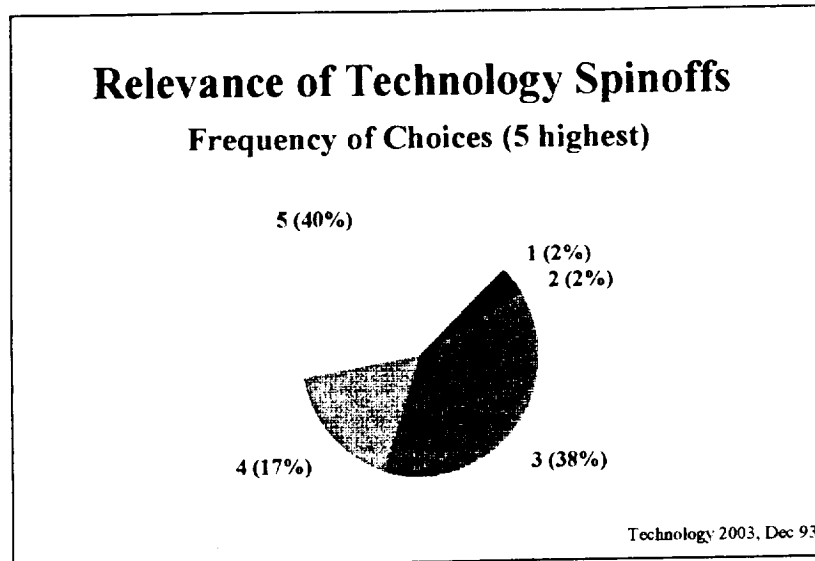


The chart that follows shows that the responses for awareness differed by how the individual responded to the technology development question. Those who believed at the 4-5 level (yes, very much...yes) that space accelerated the development of technology tended to be more aware of technology spinoffs than those who rated the space's acceleration of technology development at 2-3 (yes, a little...yes, somewhat). The technology development question also proved to be a discriminator for two other areas: Relevance and Spinoffs.

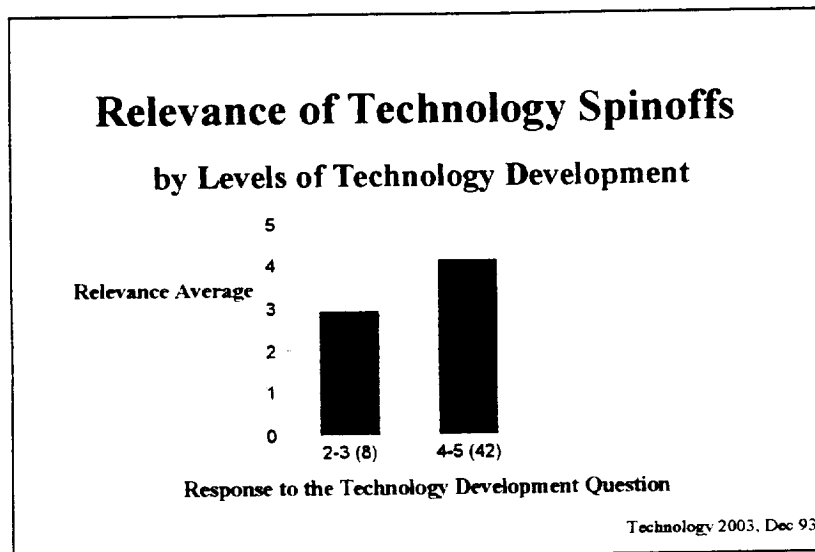


## Relevance of Technology Spinoffs

This question produced ratings similar to awareness with slightly fewer 5s but also fewer 1-2 ratings. Most people apparently think the technology spinoffs are at least somewhat relevant to their lives.

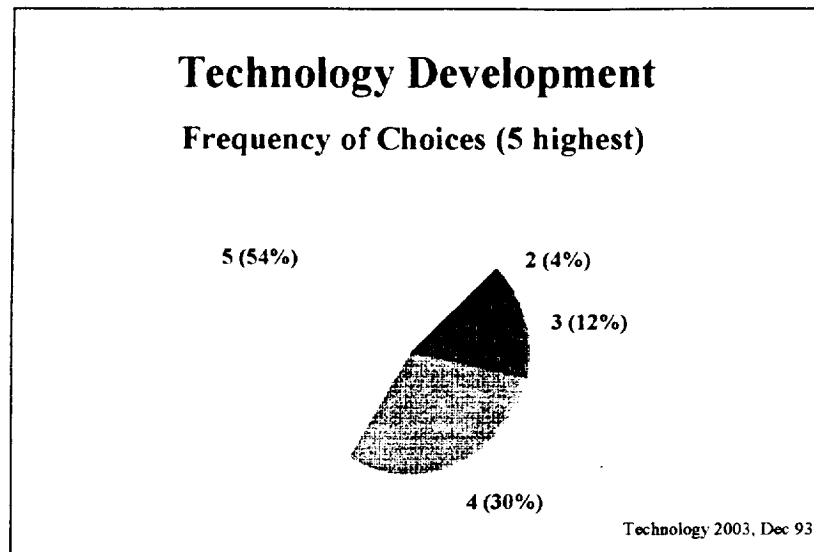


As with awareness, how they felt about space's acceleration of technology impact their responses to relevance. Again, the next chart shows that those who felt strongly about space's acceleration of technology also thought the technology was more relevant to them.

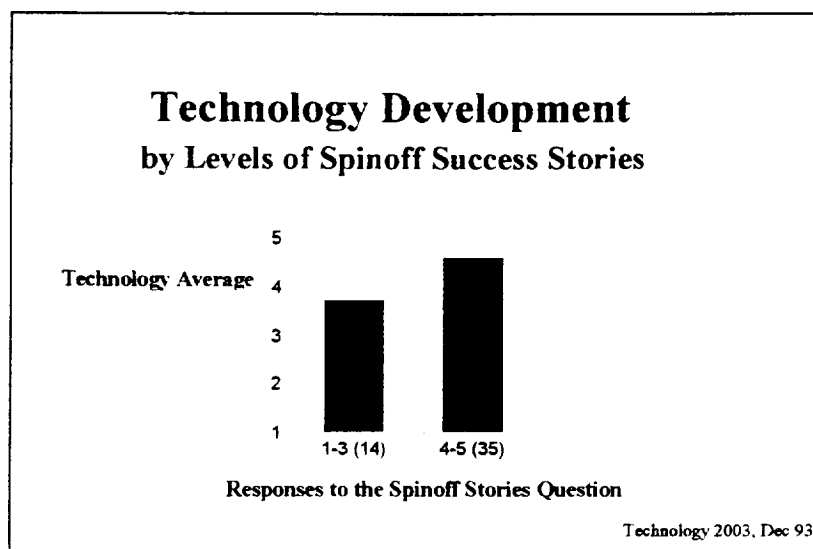


## Technology Development

Now we come to the technology development question itself and see that nearly 3/4 of the respondents rated space's contribution in the 4-5 range with most of the rest at 3.



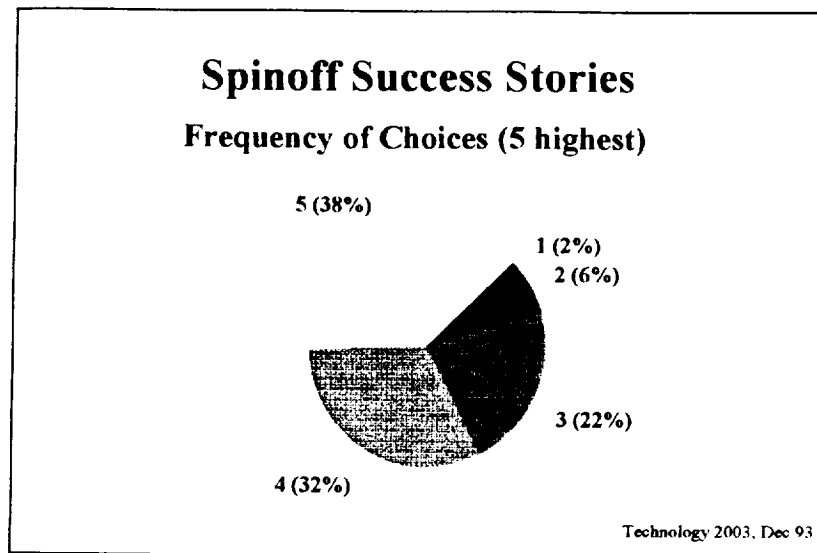
The interacting response with this question was spinoff success stories although the differences weren't quite as pronounced as those for awareness and relevance by levels of technology development. In this question, those who rated the probable impact of more spinoff success stories 4-5 (yes, very much...yes) rated the technology development question somewhat higher than those who rated spinoff success stories 1-3 (yes, somewhat...no, not at all).



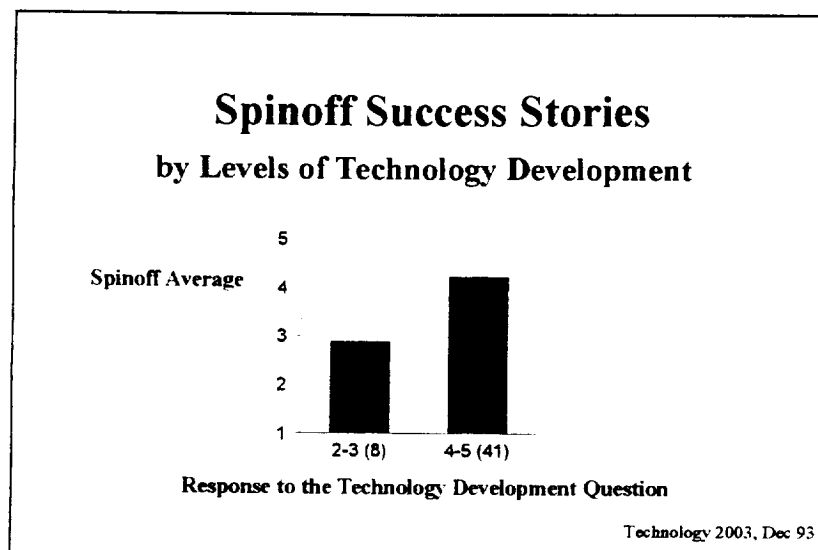


## Spinoff Success Stories

Interestingly, this question drew a high numbers--over 90 percent of the respondents felt that greater exposure to success stories would have at least some positive effect.

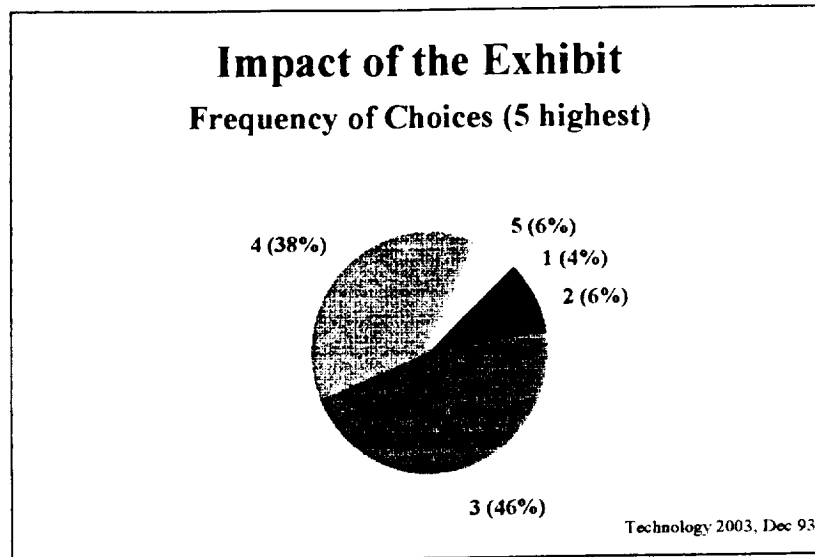


As to interaction effects, the technology question produced more of a difference for this question than this one did for technology. Again, those with 4-5 technology ratings felt more strongly about the possible effects of success story publicity than those with 2-3 technology ratings.

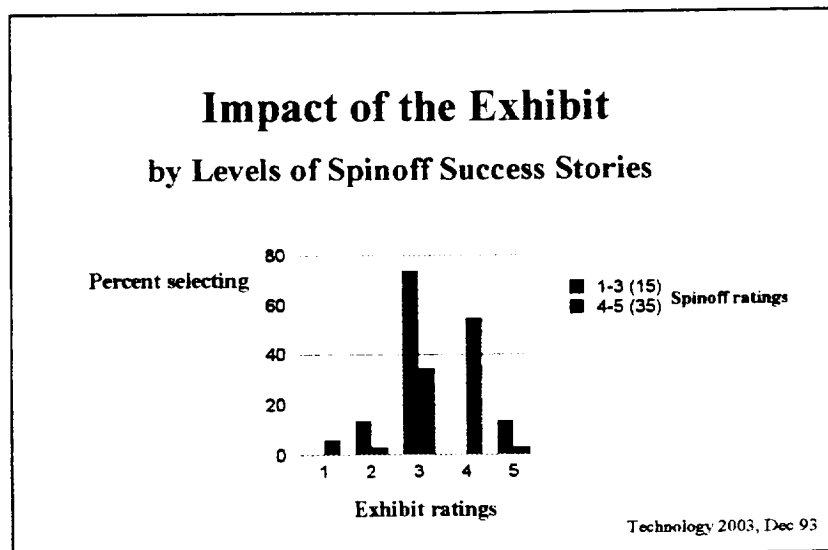


## Exhibit Impact

As was pointed out earlier, this question had the lowest average, but that could have been due to the fact that this question's "5" rating was much stronger than the others. The chart below shows that, like the other questions, over 90 percent of the respondents rated it at least 3: "some positive impact."

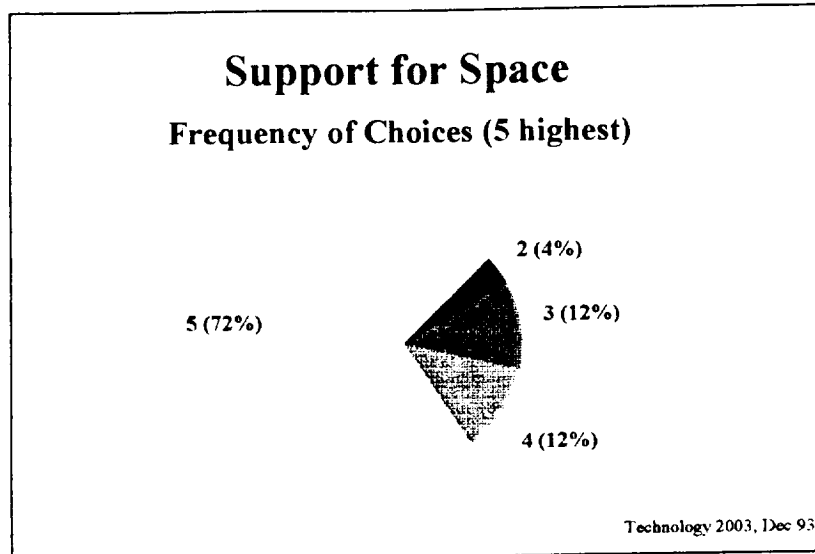


The interactive question for impact was spinoff stories. However, the interaction had a slightly different effect. While the average impact rating between those who rated spinoff stories high versus low was about the same, the distribution of responses was different. Note below how while the high spinoff stories raters had a higher percentage of "4" ratings on impact, nearly all the "5" ratings on impact came from the low spinoff group. This makes some sense if one realizes that we have a greater chance of impacting those who are not that enamored with space to start with than those who are. We asked if the exhibit made a difference. Those already exposed could not say, "5: a real eye opener!!" but some of the others could.

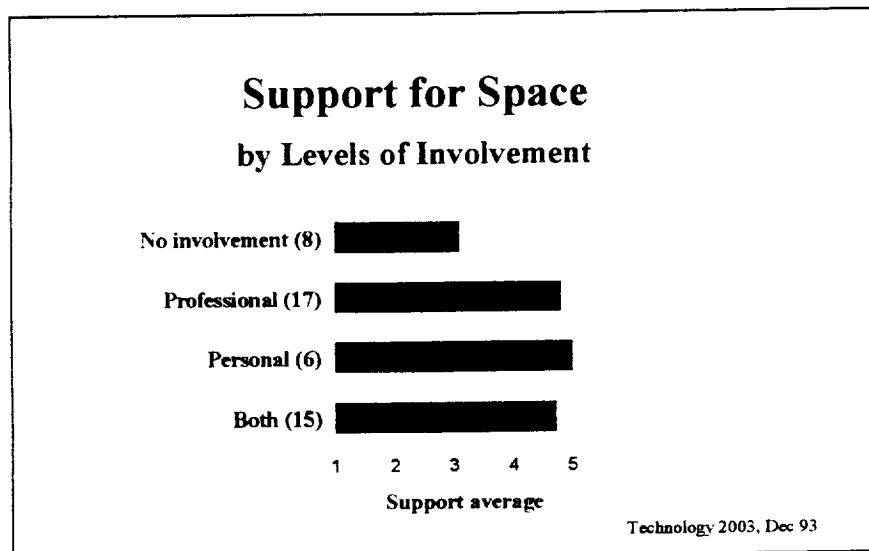


## Support for Space Activities

The last question drew typical responses when people are not asked to choose among other alternatives. Almost everyone claims to support space exploration--84 percent 4-5, and the highest average of all the questions.



However, a look at the interaction chart throws light on whom we're reaching. Recall that of those who came to the exhibit and responded to the questionnaire, less than 25 percent professed no space involvement or interest. The following chart shows that those who had no involvement (including personal interest) with space rated their support at an average of 3 (50% at 3, 25% below 3, and the other 25% split between 4 and 5) while those with personal or professional interest were nearly all 5s.



## Summary

It's hard to draw firm conclusions from such a small data base. We seem to continue to confirm that there is a sub population who like space and space activity and tend to be more enthusiastic about all aspects of it than those in the general public who have little present interest. However, the exhibit did attract and reach some non-space people as evidenced by their high ratings of the exhibit itself.

We need to continue to explore ways to get space in front of the general public, and we need to continue to assess how we're reaching them. For the next round at the Commercial Space Expo 1994, I recommend more sophisticated data collection software (better displays than pure text) with some creative means to get people to use it.

# **Appendix**

## **Computer-Based Questionnaire**

### **Screens/Questions**

## Tech2003 Screens/Questions

### Opening

Welcome to the Space Technology Hall of Fame Exhibit!

Please take about two minutes to record your opinions.  
This research on the public's perceptions of  
space benefits and space technology is sponsored by  
NASA and the United States Space Foundation.

As you answer questions on this terminal, you do  
NOT need to press the ENTER key. As you respond to  
each question, you will be advanced to the next  
question automatically.

If you ever encounter a question you don't want to  
answer, just press '0' :  
Please press any key to continue.

### questionaware

On a 5-point scale...  
How AWARE are you about technology spin-offs  
from space and aviation?  
5: Very much aware  
4:  
3: Somewhat aware  
2:  
1: Not at all aware  
0: no opinion/don't wish to answer

### questionrelevance

On a 5-point scale...  
How RELEVANT to your life are technology spin-offs  
from space and aviation?  
5: Very relevant  
4:  
3: Somewhat relevant  
2:  
1: Not at all relevant  
0: no opinion/don't wish to answer

**questionaccelerate**

In your opinion, has the space program  
ACCELERATED the development of TECHNOLOGY?

5: Yes, very much

4: Yes

3: Yes, somewhat

2: Yes, a little

1: No, not at all

0: no opinion/don't wish to answer

**questionstimulate**

Would greater exposure of space technology spin-off  
success stories stimulate more activity in this area?

5: Yes, very much

4: Yes

3: Yes, somewhat

2: Yes, a little

1: No, not at all

0: no opinion/don't wish to answer

**questionimpact**

On a 5-point scale...

What was the IMPACT of this exhibit  
on your perceptions of space benefits and space technology?

5: A real eye opener!!

4: Significant positive impact

3: Some positive impact

2: Little positive impact

1: No change

### **questionsupport**

On a 5-point scale...

How SUPPORTIVE ARE YOU of continued involvement of the United States in space exploration and technology?

5: Very supportive

4:

3: Somewhat supportive

2:

1: Not supportive

0: No opinion

### **questionage**

When were you born?

Please press the LAST TWO DIGITS OF THE YEAR

you were born. If you do not want to answer, please press 88.

### **questionspace**

This is the last question!! Thanks so much for your time...

What kind of INVOLVEMENT WITH SPACE or space technology do you have or have you had?

1: None

2: Government including NASA, military, or government contractor

3: Commercial

4: Space advocacy organization

5: Personal interest

6: Two or more of responses 2-5

7: Other

0: No opinion

### **Closing**

Thank you. That concludes the questions.

This terminal will be ready again in a few seconds.